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Combat Crew

strategic air command

JULY 1990

★★★★

Combat Crew

Magazine of the Strategic Air Command—40th Year of Publication

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On Our Cover

To reflect this month's pillar in this year of reviewing the fundamentals, a window from the SAC Memorial Chapel is featured. This stained glass window is dedicated to the warriors and the families who stand behind them serving their country in the Strategic Air Command.

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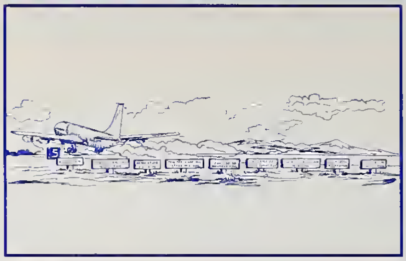

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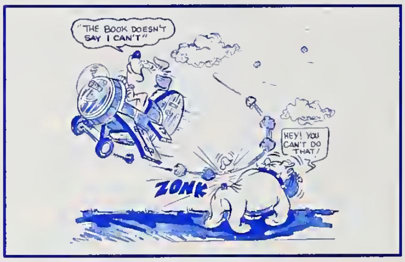
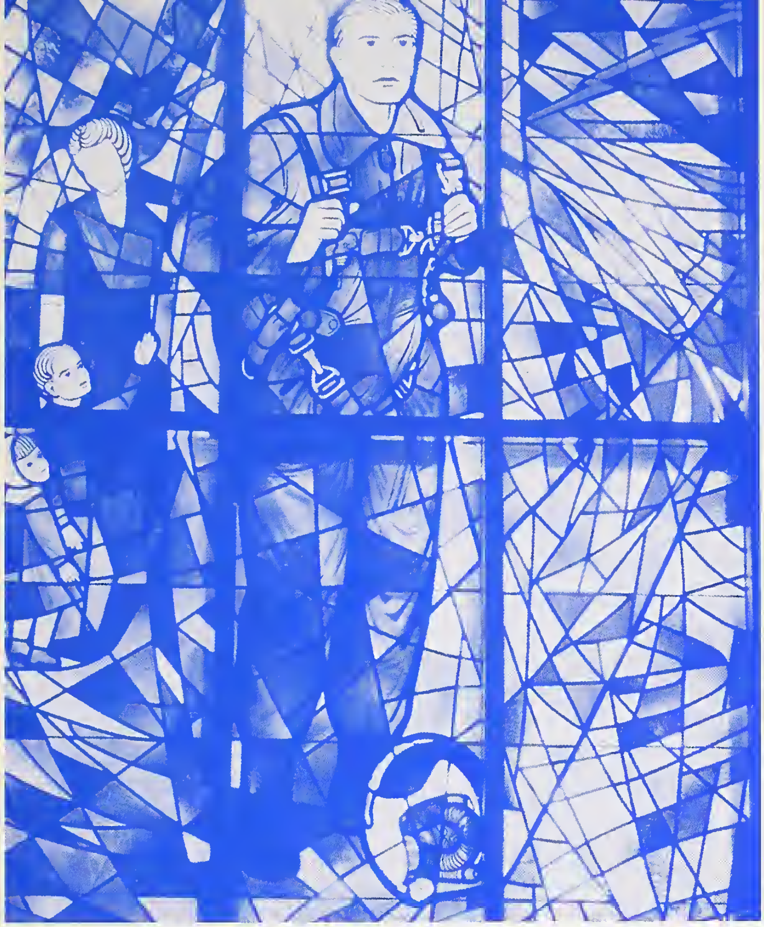

"THE BOOK DOESN'T SAY I CAN'T"
HEY! YOU CAN'T DO THAT!
ZONK

But It Doesn't Say You Can't. 16

From The Editor's Desk

This month's issue demonstrates the maxim, "There are no new lessons in safety, only new people to learn the old lessons." It's much easier to learn the " old" lessons from these pages than to discover the lessons the hard way yourself.



"Our Special Society"

The Air Force is a special "Way of Life" – we are a "society within a society." We have proud traditions. One is a tradition of family teamwork built on service to our nation. This quarter, in SAC's Year of Reviewing the Fundamentals, we focus on the communities we live in: our families, our environment, and the relationship we have with our local communities. I believe these three fundamentals are very important to the strength of SAC forces.

The Air Force way of life is a tremendous opportunity for families to live with a sense of accomplishment and belonging that is unique within our special society. A sense of accomplishment because families are the foundation upon which an effective warrior builds his profession. A sense of belonging because every SAC family is part of a distinctive community with a common cause –to preserve peace and the American way of life. Accomplishment and belonging are the ingredients that make up the recipe of teamwork so vital to the combat capability of the Strategic Air Command.

The bottom line of combat capability is simple: is it strong enough to fight and win? No matter how spectacular the weapon systems or how impressive the ideals, the only measure of a fighting force is its ability to fight and win. It has been said that weapons don't win wars – people do. I believe that people still win wars today. And family teamwork makes the difference whether or not SAC warriors can fight and win.

Teamwork means working together for the success of the team. Teamwork means putting others ahead of ourselves. SAC families are frequently called to support their warriors who may go to war at a moment's notice. SAC families put the needs of the Air Force ahead of their own: moving frequently and sometimes to out of the way places; accepting separation as part of a warrior lifestyle; and understanding when their SAC warrior has to work late at the flightline or office. No matter what kind of family situation you may be in – dual military couple, single parent, or traditional – the essence of successful teamwork is the same. That is, from your family comes the support to commit yourself to an uncompromising standard of excellence in service to your nation.

The picture on the front of this month's issue of Combat Crew signifies the dedication of SAC warriors and their families. Today both men and women serve proudly as SAC warriors, and SAC families are working together as a team to continue to preserve peace and the American way of life.

So it is my privilege to say thanks to all SAC families. To thank you for the vital role you play in the defense of your nation. By sacrificing many of your own needs and comforts, your SAC warriors can dedicate themselves to their missions, and provide winning combat capability. ★★★★

General John T. Chain, Jr.
Commander in Chief
Strategic Air Command

BURMA SHAVE

Maj G. F. Lightly
96 BMW, Dyess

There I was...on an eventful flight.

"That was a close shave," I said as calmly as I could under the circumstances. The pilot had just taken the airplane away from me to miss the other tanker.

Let's see now, where did I go wrong?

My crew was hot. We just finished a 34-day Pacific Tanker Task Force with 17 flights for a whopping 90 hours. The 11.2 hour flight from Seymour to Hickalulu didn't hurt. The flights out of Hickam, Kadena, Clark, Osan, and Andersen were fantastic. We completed all our missions, flew a bunch of cell, and refueled loads of jets.

It's great being there

Yes, we were hot. However, mission planning was a drag. We filled out the forms IAW. Of course, we crosschecked it all with cell leads. We would fly cell to AR 601 which was only 33 minutes away. There we would refuel eight F-4s from the local wing. Afterward, we would fly an hour and a half nav leg. Then each pilot would get an approach and we'd log about a 5.2. Not a bad day's work.

While traversing the air

Weather might be a problem, though. Early December meant winter storms riding along the dipping jet stream and one was forecast during the latter portion of the mission. Of course, there'll be a lot of clouds but with a good radar, no problem.

Show time was a delightful 0745, which allowed for a nice evening and adequate crew rest. Still, I had rushed to make it to the cell briefing on time,

5
BURMA SHAVE
IT'S COLD AND DARK IN THE GRAVE
BEING STUPID IS NO RAVE
PRACTICE WHAT YOU LEARNED IN SCHOOL

for I had gotten a little behind that morning.

Follow the regulation

“Acorn 71 is parked on Baker 9 and 72 is straight across on Able 9,” droned cell lead, Captain Steve Straite, a spring buck of English descent who loved to follow the letter of the law, oftentimes missing the whole forest while he was counting every tree. “And your takeoff is 1016.”

One minute later. I could never figure out why we had to wait 60 seconds. It meant we had that much more time to make up. I always shot for 30 seconds. I liked being in there. The ubiquitous “they” liked that aggressiveness...higher, faster, tighter, better!

“Several decks of clouds are forecast,” the captain continued, “so use all available means to ensure aircraft separation.”

Sure, no problem, I reflected.

“Differential airspeed should be the primary means and we’ll use MRT minus .1 to help you catch up,” mentioned the briefer methodically. “It should not be clear enough to use visual cutoff.”

My Jiminy Cricket whispered to me, “That would be dangerous.”

Do it with moderation

“For intermediate leveloffs, stack down at 500-foot intervals. Final leveloff will be 210 block 220 and we’ll be at 210. You be at 215.”

“Normal! Normal! Let’s go fly!” I impatiently thought to myself.

“The CIF is number 9.”

Interesting how the number nine keeps popping up in life, I mused to myself, as my mind wandered to 9 planets, 9 months of pregnancy, Cloud 9, Channel 9, 9 holes...

“Are there any questions?” Captain Straite dutifully asked.

“Hey, Ace, don’t forget to sign off the CIF,” reminded the boom operator, a burly boy by the name of Bob Brewster. He had several task forces under his belt. I could trust him to keep me out of trouble. He could get the job done, safely and efficiently. A conscientious hard worker, he was. I liked him.

They must have slipped in another CIF after we left mission planning at 10 a.m. yesterday. Straight Arrow overlooked briefing it. He wasn’t together after all.

Safely the mission gets done

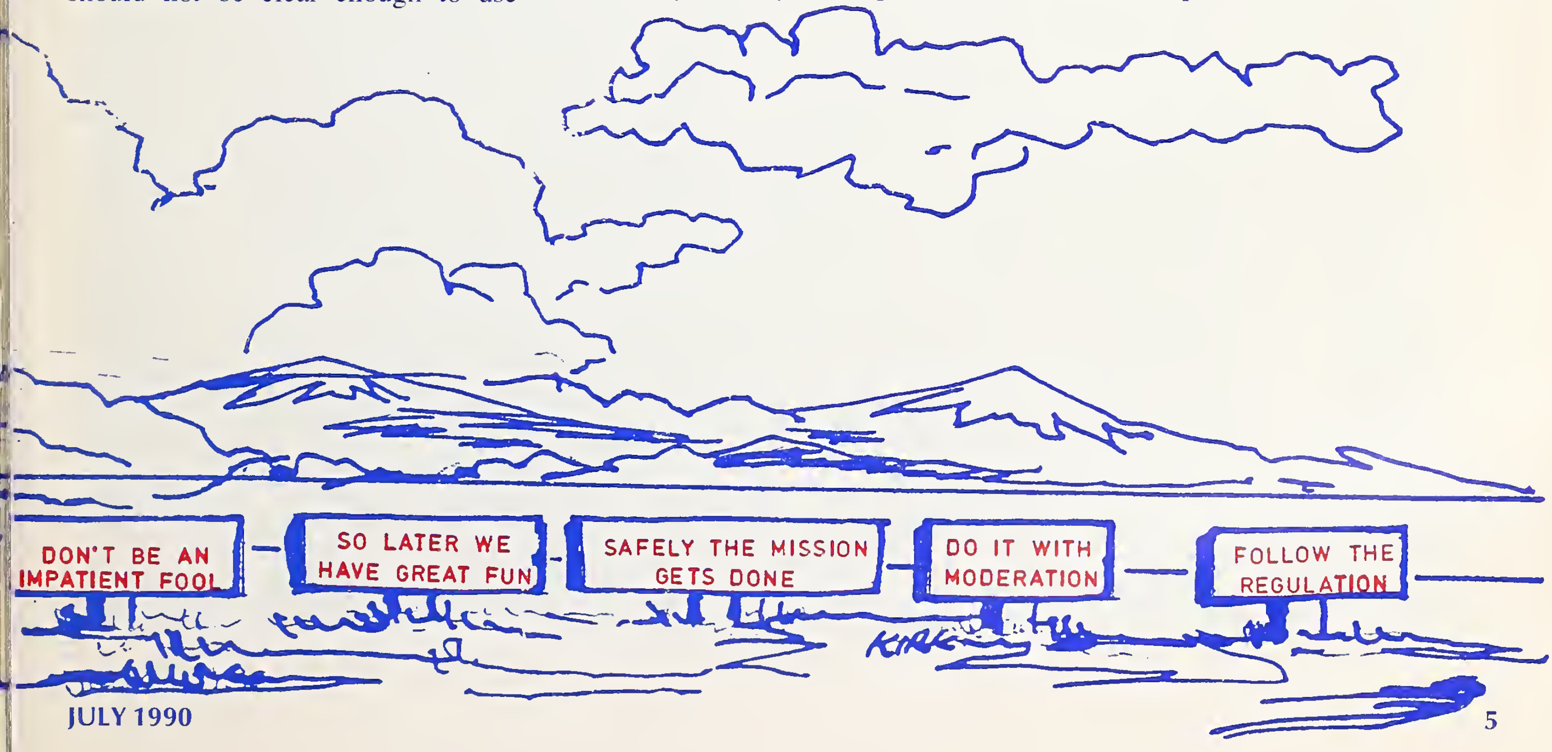
Light rain had begun falling as we finished preflight, but with no maintenance problems the pilot had time to compute the wet runway data.

“No problem, Ace,” proudly announced 1Lt “Dill” Pickle, who had been a shoe salesman and an aero engineer in Alabama before flying the friendly skies of UPT. He was a likable sort of guy. Our most memorable conversation was about the origins of man in the primordial soup of existence. A carefree spirit, he loved to talk about anything. My kind of guy. Someday we’ll have to discuss the spiritual significance of the number nine.

“Acorn 71 flight, winds 240 at 10, you’re cleared for takeoff.”

Hot damn! Here we go!

We were already moving onto the runway when 71 released brakes. Into his billowing, black smoke of the typical KC-135A wet takeoff we waddled, buffeted by his jet. I was going for 30 seconds and the crew was with me, as we used it quite often in the Pacific.


DON'T BE AN IMPATIENT FOOL
SO LATER WE HAVE GREAT FUN
SAFELY THE MISSION GETS DONE
DO IT WITH MODERATION
FOLLOW THE REGULATION
KIRK

BURMA SHAVE...

So later we have great fun

"Start the water!" I loved to bellow that command.

"Thirty-five seconds, Ace," the nav informed me, as I released brakes. No problem. I'll make it up, I thought to myself.

Acorn 71's smoke cleared as we steam-rolled down the concrete. I held the airplane on the ground another ten knots for mama and the kids, as we had no obstacle. I could never figure out why the performance manual (and for that matter the ubiquitous "they") wanted us to fly off the ground so close to our minimum performance. It was dumb as dirt, as worthless as the altitude above you, the runway behind you.

"I've got him on radar, three miles," dutifully reported Johnny B. Goodfellow, still a butterbar but seasoned now with Pacific spices. He was eager and pilot qualified and with a little luck should be accepted into UPT in a year. Johnny B. was always asking questions about the flying up front, but being a good aircraft commander, I never let him fly the plane.

"Rog, we've got a visual," the pilot quickly responded.

"Lead's passing 4000, heading 270," squelched Steve-o-rino.

"Two's passing 2, heading 275," I echoed impassionedly.

"He's three miles."

Don't be an impatient fool

I looked down on our radar and confirmed the three. "Roger."

"Approaching 285 knots," announced the pilot.

"Roger, I'm increasing to about 300," I decided.

Now the departure had two turns in it, and I could catch up to 71 easily if I were to cut off a bit of those turns. There were only a few puffers here and there. No problem!

"Approaching two and a half miles, 12:30," iterated the nav, not fully realizing how close that really was.

"Roger, tally ho! Turning early to get him, nav," I said with my usual vigor.

"Center, 71 flight's passing 8000 for the block 21 to 23," reported 71 calmly, not realizing the grave danger closing in on him.

The pilot kept peering outside, trying to keep lead in sight. "Lost him in the cloud deck."

"He's two miles, one o'clock," imputed Johnny B.

Practice what you learned in school!

Looking good, I complimented my ego.

"71, say altitude," I queried, as we flew through 9000.

"Passing 10.5."

Looking better all the time, I flattered myself.

"Still no visual," the pilot reported, but with a distinct difference in the tone of his voice, one I've never heard before.

"He's a mile and three-fourths, one o'clock."

We were at 295 knots and passing 9.5, and I could not see him. If I timed this rendezvous right, I'll be turning right behind him at one mile. I pulled the throttles back. I didn't need any more overtake.

Being stupid is no rave

A voice inside me began insisting, "What's his altitude?"

"71, say altitude," I demanded but with a distinguishable hint of apprehension this time, one I could not mask.

"71's passing 11. Say your position," Steve returned.

"Two's behind you about a mile and a half, passing 10," I quibbled with a twinge of nervousness in my vocal cords, as the nav officiously reported that he was at our 1:30 and less than a mile and a quarter. Still, the nav was doing a great job of position reporting.

My airspeed was slowing down to 285. Good. Now to slip in behind 71.

"71, say altitude," I blurted out.

"Passing 11.3."

As I looked down, I saw us flying through 11-thousand. Had I been unconsciously pulling up to get above him? Oh, well, trade off altitude for airspeed –that's okay, isn't it?

"Pilot, nav, he's at one o'clock and just under a mile," accounted Johnny B., forgetting to announce the turn to the left.

"That checks, but no visual on him," the pilot interjected this time, his voice annoyed.

"Pull up!" Jiminy yelled loud enough for me to hear. So I did, but smoothly so as not to alarm the crew.

It's cold and dark in the grave.

"I'VE GOT IT!" screamed the pilot as he jerked the yoke back into his lap.

A split second before, we had broken out of the clouds just enough to see this huge, dull gray, metal Boeing KC-135 Stratotanker streak past just below our nose.

"Whoa! That was a close shave! Good save, Dill. Sorry about that," I muttered in the meekest manner I could muster.

After regaining my composure, I took back the airplane and began a left turn to rejoin Acorn 71 who was now approaching four miles ahead of us. No problem. We'll carefully get into position by staying in trail and staying well below lead. There's no hurry. We've got more missions to complete.

Burma Shave

Note: This purely fictional account has no relationship to the 96 BMW, which has maintained an exceptional operational safety record. The egotistical character of this aircraft commander nearly killed two crews and destroyed two jets. This normal happy camper is well-liked in the wing. Sure, he has many things on his mind and he gripes about "they," but could he harbor dangerous psychological problems? Does he fit the description of someone in your squadron?

1989 Article of the Year

Combat Crew is pleased to announce that an article submitted by Major Fred Hadaway, 410th BMW, K.I. Sawyer AFB, has been selected as the best Combat Crew Article of 1989. This award allows the SAC safety staff to select the article that best presents the safety message.

Major Hadaway's article entitled, "When is a Crew Member Not a Crew Member?" appeared in the March 1989 issue. It vividly describes a terrifying confrontation with a life threatening situation.

In the fine tradition of Combat Crew's war stories this article provoked thought on passenger egress procedures and consideration. Major Hadaway will receive a plaque commemorating his accomplishment.

STRATEGIC AIR COMMAND

BEST COMBAT CREW ARTICLE OF 1989

IS PRESENTED TO

MAJOR FRED HADAWAY, 410 BMW

Blanchard Winners – Far Right: SAC Commander i
Chief Gen John T. Chain, Jr. and 341 SMW Commande
Col Edward L. Burchfield proudly display the Blanchar
Trophy with the rest of the Malmstrom "First Aces."

Olympic Arena

Malmstrom Wins!

341st Takes Home the Blanchard

The "First Aces" from Malmstrom AFB proved they held the best hand as the 341st Strategic Missile Wing won the coveted Blanchard Trophy at the 1990 SAC Missile Combat competition held May 10-17 at Vandenberg AFB.

By chalking up 2752 of a possible 3100 points, the 341st teams earned the right to be named the command's top missile wing. Malmstrom last won the Blanchard Trophy in 1986.

The 341st was led by its security police team which scored a near flawless 296 out of a possible 300 points. Malmstrom's security team finished first in tactics and combat arms and was named the best overall security team.

The Malmstrom security team defeated their closest rival – Ellsworth AFB – by more than 25 points, capturing top scores in two of the three security events. The "First Aces" tallied a perfect score in the combat

Best Civil Engineering Team – 91 SMW. (R-L): Col Eugene Lupia, Deputy Chief of Staff, Engineering and Services, HQ SAC; Daniel J. Hastings, WG-10; TSgt Paul H. Roberts, Jr. and their commander.

Best Missile Communications Team – 341 SMW. (R-L): SSgt Roger D. Ash, A1C Kurt E. Ryman, and their commander.

Best SP Confidence Course Exercise – 44 SMW. Team members are pictured with Col Stephen Heppell, Deputy Chief of Staff, Security, HQ SAC.

Best SP Combat Marksmanship, Tactics, and Overall Missile Security Team – 341 SMW. Team members are pictured with Col Stephen Heppell, Deputy Chief of Staff, Security, HQ SAC.

Best Munitions Team – 44 SMW. A1C Lonnie McNeil, SrA Tom Carlson, SSgt Mike Butler and Maj Gen Charles J. Searock, Jr., Deputy Chief of Staff, Logistics, HQ SAC.

Best Electro-Mechanical Team – 351 SMW.

Best Pneudraulics Team – 341 SMW. Sgt Thomas A. Young, Sgt Troy E. Smith, and Maj Gen Searock.

Best Power-Refrigeration-Electric Team – 321 SMW. Sgt Michael R. Manning, Sgt James P. Curran, and Maj Gen Searock.

Best ICBM Maintenance Team – 351 SMW. Team members are pictured with Lt Gen E.G. Shuler, Jr., commander, 8th Air Force.

Best Minuteman II/CDB Crew – 341 SMW. 2Lt Larry Elmen, Capt Paul Harr, and Maj Gen John Borling, Deputy Chief of Staff, Operations, HQ SAC.

Best Minuteman Mod/CDB Crew – 91 SMW. 1Lt Michael E. Fortney, 1Lt Douglas R. Stickle, and Maj Gen Borling.

Best Minuteman Mod/ILCS and Best ICBM Combat Crew – 351 SMW. 1Lt Robert M. Walker, Capt Randy M. Bagby, and Maj Gen Borling.

Best Minuteman Mod/SSAS Crew – 44 SMW. 2Lt Gary A. Ashworth, Capt Thomas Peppard, and Maj Gen Borling.

Best Peacekeeper Crew – 90 SMW. Capt Bob Provost, Capt Jim Tucci, and Maj Gen Borling.

Best ICBM Operations – 351 SMW: 1Lt Michael E. Shavers, Capt Timothy C. Olson, 1Lt Robert M. Walker, Capt Gary R. Hanson, 1Lt Clyde A. Wierick, 2Lt Dawn M. Parker, Capt Randy M. Bagby, 1Lt Mary R. Estabrook; their commander; and Lt Gen R.D. Beckel, commander, 15th Air Force.

marksmanship event and finished just two points shy of a flawless tactics performance.

Malmstrom team members fell short in their bid for a sweep as the Ellsworth AFB security team edged them 40-38 in the confidence course competition. Ellsworth finished second to Malmstrom in the overall security competition.

In addition to capturing the Blanchard Trophy, the "First Aces" also took first in the communications and pneumatics competitions.

Malmstrom's communications team turned the pressure of a three-day wait into victory. Competing on the final day, SSgt Roger Ash and A1C Kurt Ryman, members of the 2153rd Communications Squadron representing the 341st SMW, earned 192 of a possible 200 points.

The 44th SMW team from Ellsworth was a scant two points back in the communications competition, earning 190 points and helping their team finish fourth in the overall standings.

Last year's Blanchard Trophy winner, the "Warriors" of the 351st SMW, Whiteman AFB, fell 13 points short of defending their title, finishing second in the overall competition with 2739 points. The 351st maintenance and operations teams took first place in their respective categories, with crew S-210 being named the competition's best ICBM combat crew.

Grand Fork's 321st SMW placed third in the overall scoring. The "Warriors of the North" had the competition's best power, refrigeration and electrical team.

The "Black Hills Bandits" of the 44th SMW, Ellsworth AFB, trailed Grand Forks by four points.

The "Roughriders" of the 91st SMW, Minot AFB, finished fifth in the overall competition, but its two-man civil engineering team took first in its category. Minot AFB finished with 2676 points, edging out the "Mighty Ninety" from F.E. Warren AFB. The 90th SMW placed sixth.

Other winners are:

Best MMM/SSAS Crew – S-027, Ellsworth AFB

Best MMM/ILCS Crew – S-210, Whiteman AFB

Best MMM/CDB Crew – S-911, Minot AFB

Best MMII/CDB Crew – S-320, Malmstrom AFB

Best Peacekeeper Crew – S-254, F.E. Warren AFB

Best Munitions Crew – Ellsworth AFB

The annual missile competition provides an opportunity to refine techniques and procedures, exchange professional information, recognize outstanding individual and team performance and enhance espirit de corps. The winners were presented trophies by General John T. Chain, Jr., SAC Commander in Chief, at an awards ceremony on May 17th.

Flyin' Lesson Number 1673

And what a flying lesson it was ... and I'm still getting paid to do this stuff.

Lt Col David S. Thompson

It's a normal T-38 flight. Could be a UPT syllabus sortie, could be an ACE sortie, or it could have been a sortie in a T-37, a C-21, a fighter –anything without the long legs of a bomber or tanker. The flight has progressed normally up through the approach at a strange field. What makes this field strange beyond my unfamiliarity with it? It's a SAC installation. And that's strange enough.

I've checked in with tower at about five-mile final. I'm cleared to land as number three. But there is this obnoxious horn in the background. It's not my gear horn either. It's coming from the UHF receiver as if a horn is blowing in the tower. But I'm cleared to land. It's a KC-10 that I'm following and I need four minutes behind him, not three miles. So tower advises me to stand by for a handoff to approach control. I can't stand that, the gas is disappearing too fast. So I utter the magic words to tower: "Be advised I'm minimum fuel." Tower knows just what to do. They send the KC-10 around (serves those Gucci boys right for making all that wake turbulence anyhow) and clear me to land. My troubles are over.

Now tower broadcasts one of those heart stoppers: "SAC exercise in progress, all aircraft are restricted to low approach at or above 1000 feet. Expect a thirty minute delay." Rats. I'll try this: "Tower, Pucker 33 is inside the final approach fix, gear down, minimum fuel." Let's see if that'll cut the mustard. Well, it doesn't, tower reissues the low approach clearance.

Now I'm in trouble. I reemphasize I'm short on gas. The tower offers to send me to the municipal airport that is only eight miles away. But I don't know how long the runway is, what the approaches look like, how I will get some gas, and above all, how I will explain this to the boss. I ask the tower for runway length, but they don't know. And now to add to their workload they have another trainer in the pattern who is minimum fuel. Great. The command post now gets in the act and the plot thickens. I'm asked my fuel again. I'm a hundred pounds above emergency fuel –that's three minutes. Later I find out that the command post garbles the message into a hundred gallons, only three minutes of fuel left until dry tanks. I finally get cleared into the closed pattern and tower bugs me about the fuel state again. I don't need his questions, just his landing clearance – after all, I can hardly get my eyes off the fuel quantity anyhow. The tower advises I'll have to declare an emergency to get landing approval. But I'm still above the emergency numbers when I hear the alert exercise terminated. I'm cleared to land when the low fuel lights come on.

Taxiing to parking is uneventful since I do have that much gas. But who is waiting on me but the safety officer, with his famous words: "I have a couple of questions to ask you."

Question number one: "Where did you screw up your mission planning?" (Not even nice enough to ask what happened so I could tell my side of the story.)

Answer number one: "I didn't have a suitable plan for the 'what ifs.' What if someone blows a tire and closes the runway ... what if someone blows the horn and closes the runway. I should have known where ALL available alternate runways are, including civilian fields. I should have known how long their runways are, and what the approaches look like. How am I doing?"

"Okay, so far. Question number two: What does 'minimum fuel' mean to you?"

Answer number two: "Six hundred pounds?"

Safety Sam: "Not so good now. Minimum fuel is that quantity of fuel required to land in the normal sequence of traffic, without delays, and land safely." Now question number three: "What's emergency fuel?"

Answer number three: "Four hundred pounds?"

Safety Sam: "Wrong again, jet fuel breath. An emergency is declared by the pilot when he requires TRAFFIC PRIORITY. Emergency fuel is a state of fuel where you require priority handling to get the bird on the ground safely. You can no longer stand the 'normal sequence.' What happens if you have eight hundred pounds of fuel, you are on final with the closest alternate 800 miles away when the field is closed with a thirty minute delay expected? You are at emergency fuel right then! Emergency fuel is based on the situation, not just on the number on the fuel quantity gauge.

"Oh, another thing. SAC bases have this nasty habit of closing runways when least expected. When the Alert Force is exercised, the infamous klaxon blares all over the base, and the tower closes the runway to prepare for an emergency launch of the alert force. This may be the first outward sign of the start of the big war. SAC gets real serious about that. The bombers and tankers MUST get airborne if required by the emergency war order. So until the horn is shown to be an exercise, we treat it like the real thing. And you can expect a thirty minute delay anytime you arrive at any SAC installation."

Lessons learned in Flyin' Lesson Number 1673:

- **Better Mission Planning.**
- **Expect delays at all SAC bases.**
- **The real definitions of fuel states.**
- **Flying safe is flying smart.**
- **I learned.**
- **You, too, can learn.**

Fly Safe ... Fly Smart.

Author's note: Although dramatized just a little, this scenario recently took place at a SAC base.

HEY! GIMMY A BREAK, I'M DOWN TO 100-POUNDS
SPUT
SPUT
US AIR FORCE
KIRK

Everyone Was Laughing But Woody

Lt Col James D. Teigen
HQ SAC/IGFF

It was a quiet day in the office. The biggest thing going on was the rehashing of war stories we had amassed over the years. As I remember, Bernie (my boss) was really into a funny one and the right hand was winning. He had just gotten to the punch line, and so we were all laughing when it started.

Everyone was laughing but Woody. From his lips came a sound not unlike a slow leaking tire. Odd way of laughing, I thought, the story was funnier than that. As the rest of us quieted down, Woody was still making the noise, but much more softly. I turned and saw Woody's complexion turning a dark reddish blue.

Bernie and I bolted out of our chairs and ran over to help Woody, calling his name on the way. There was no

response, in fact, he wasn't making a sound. Small bubbles were coming from his mouth, and his jaw was set tight.

Woody's chair and desk were situated such that when he sat at his desk he faced the room, his back against the wall. Now we found him braced against the wall, his chair and his feet wedged under his desk. He was stiff as a board.

"Woody's not breathing!" I shouted. "Quick, we've got to get him away from his desk and onto the floor." As Bernie moved Woody's desk and I moved his chair, we freed Woody so we could move him. I asked Bernie to get Woody's feet as I was planning to lower him to the floor when Bernie gave a hard yank.

It was the loudest thunk I've ever heard. Woody came out of the chair and dropped to the floor. I don't think he felt it. I felt for a pulse, there was none. Woody was not breathing either.

I pried Woody's mouth open to clear his air path, and then I began CPR. After giving Woody the required breaths of air, I began on his heart. During this time, I called to the secretary to get an ambulance, then it was back to giving breaths of air. This wasn't working, I thought. In the course, the victim recovers quickly.

Where was the amublance? I couldn't get a pulse, and Woody was not breathing on his own. I didn't remember the CPR instructors telling us that you would get really tired giving CPR, but I did remember them telling the class if you start CPR you have to continue until the medics arrive.

As I gave Woody his heart massage, I heard Bernie yelling, "Where's the ambulance?" The secretary was on the phone giving directions to base operations. How, I wondered, could the ambulance forget where base operations is located? This can't be happening!

Out of the blue, I began to get a pulse! Still, Woody was not breathing on his own. Then there was a huge gasp, Woody blinked and looked at me, fear apparent in his eyes.

"Where am I? What's going on? What happened?" Woody asked between coughs.

Finally, the ambulance arrived, and the medics began asking lots of questions. I went over the details as well as I could remember. Bernie told them that I had been giving CPR for over 15 minutes before Woody started breathing on his own. No wonder I'm tired, I thought.

Woody was generally amazed. He remembered Bernie's story, but not the punch line. Then he woke up with me pressing on his chest.

Woody was admitted to the hospital for several days. The doctor said he had suffered a grand mal seizure brought on by diabetic shock. We didn't even know Woody was diabetic. He completely recovered. I later asked him if his head hurt, and he said, "No, why?" I didn't have the heart to tell him.

To seize the moral of this story, do you know CPR? In the middle of a lazy afternoon, are you ready to give CPR? Don't you hope those who work around you know how? Take a course, it's not hard to do.

“But It Doe
Can’

Lt Col James D. Teigen
HQ SAC/IGFF

It amazes me how often I’ve heard that phrase used as the reason for some feat of airmanship. I guess the part that amazes me is the fact I’m having the conversation with the lucky aviator, instead of the next of kin.

I know it wasn’t the first time I heard the phrase, but it was the first time it burned a hole in my memory. It’s stayed there since then and maybe now is the best time to pass it on again.

The crash phone had just rung, we had a T-38 coming home with only a back seater. The student had ejected during the mission, but we didn’t know why.

As an ATC Flight Safety officer, I sat near the end of the runway on the hammerhead waiting for the jet to clear the runway. Sure enough, here came a “perfectly good” T-38 without a front canopy, front seat, or occupant. It was a weird sight to say the least. The back canopy was blackened and I could hardly see the IP in the rear due to the soot from the student ejection seat firing.

If you’ll stop there and hold the brakes, I’ll climb up the side and shut down the engines for you, I told the IP.

The roger was a weak, and dejected reply.

After shutdown, I informed the IP of the AFR 127-4 statement for witness interviews and asked him if he wanted to tell me what had happened.

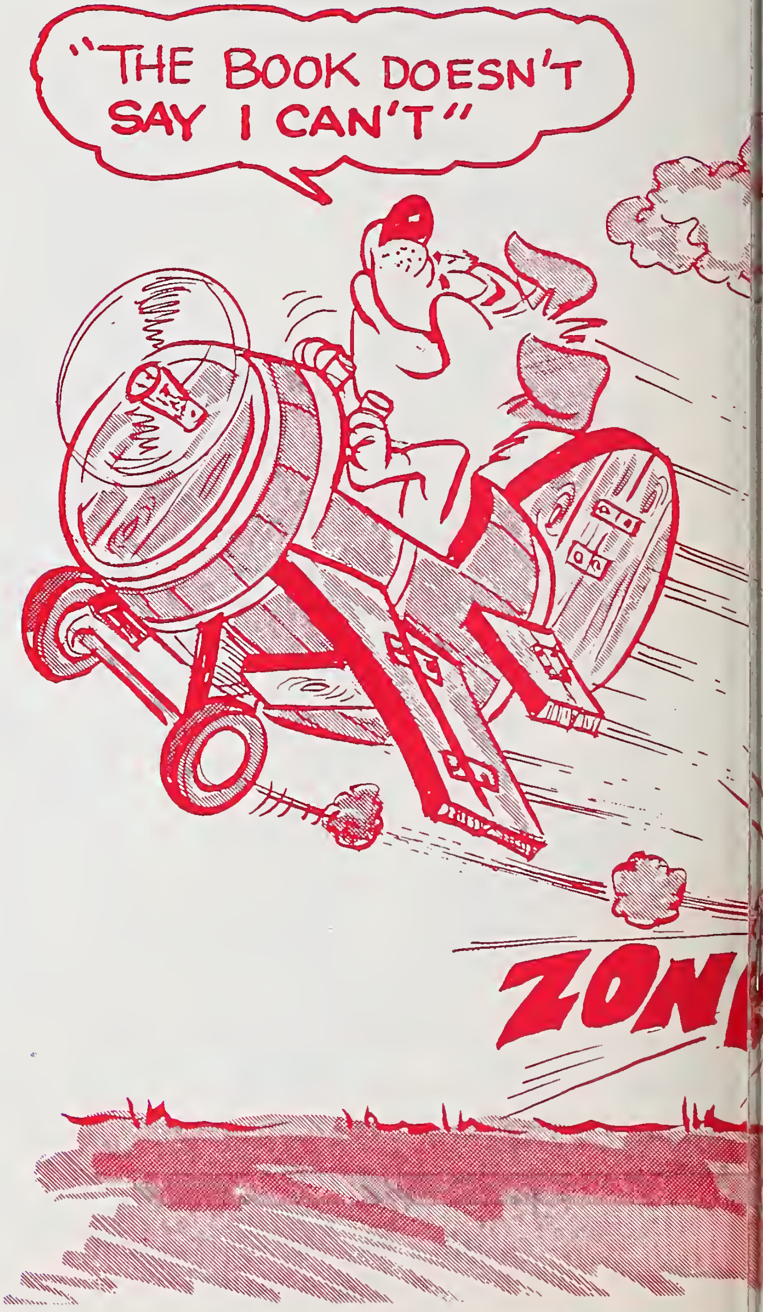
It was a dollar ride (first sortie in a new aircraft) for the student pilot. The profile had called for a rudder effectiveness demonstration in the training syllabus. He went on to tell me normally it was accomplished with the gear up but he always liked to get the student’s attention with a fully configured (read: gear down) aircraft. (The difference was six degree rudder throw –clean, versus 30 degree rudder throw with the gear down!) During the maneuver the rudders are moved to show how effective they can be at slow speeds, like in the pattern. Of course, these are practiced at altitude, and for a good reason as our IP learned.

So the IP set up for the demonstration, lowered the gear and showed how effective the rudder was at slow speeds. He went on to say, with the gear down, the T-38 really put on a show.

Then the aircraft departed controlled flight!

The story got really bizarre about this point. Inverted, right side up, oscillations, nose not tracking, stick unresponsive, you name it, it was a wild ride.

The IP tried all kinds of control inputs, but none worked. He even tried some old T-37 antispin and spin recovery techniques, and sure enough, they didn’t


“THE BOOK DOESN’T SAY I CAN’T”
ZON

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...

work either. As I listened to the story I wondered what the student must have thought looking out over the nose on his first T-38 ride. It must been a wild one at that.

As they approached 10,000 feet, and still no success in getting the jet to fly, the IP told the student, “I think it’s time to get out.”

HEY! YOU CAN’T DO THAT!

The student finally got the idea passing about 8,000 feet and ejected. (He later said that he was waiting for the IP to go first, per tech order guidance.)

The student’s ejection helped drive the nose into the recovery zone, then the shift in the center of gravity helped pull the jet out. And the T-38 was flying again. It had lost about 20,000 feet, and in less than a minute!

I asked him why he did the demo configured.

His reply was those fateful words, “It doesn’t say you can’t do it...!”

We were lucky, the student got a good chute. The canopy and seat were a writeoff, as was the rear canopy. Both the student and the IP survived to fly another day. The plane was repairable. There were no widows to interview.

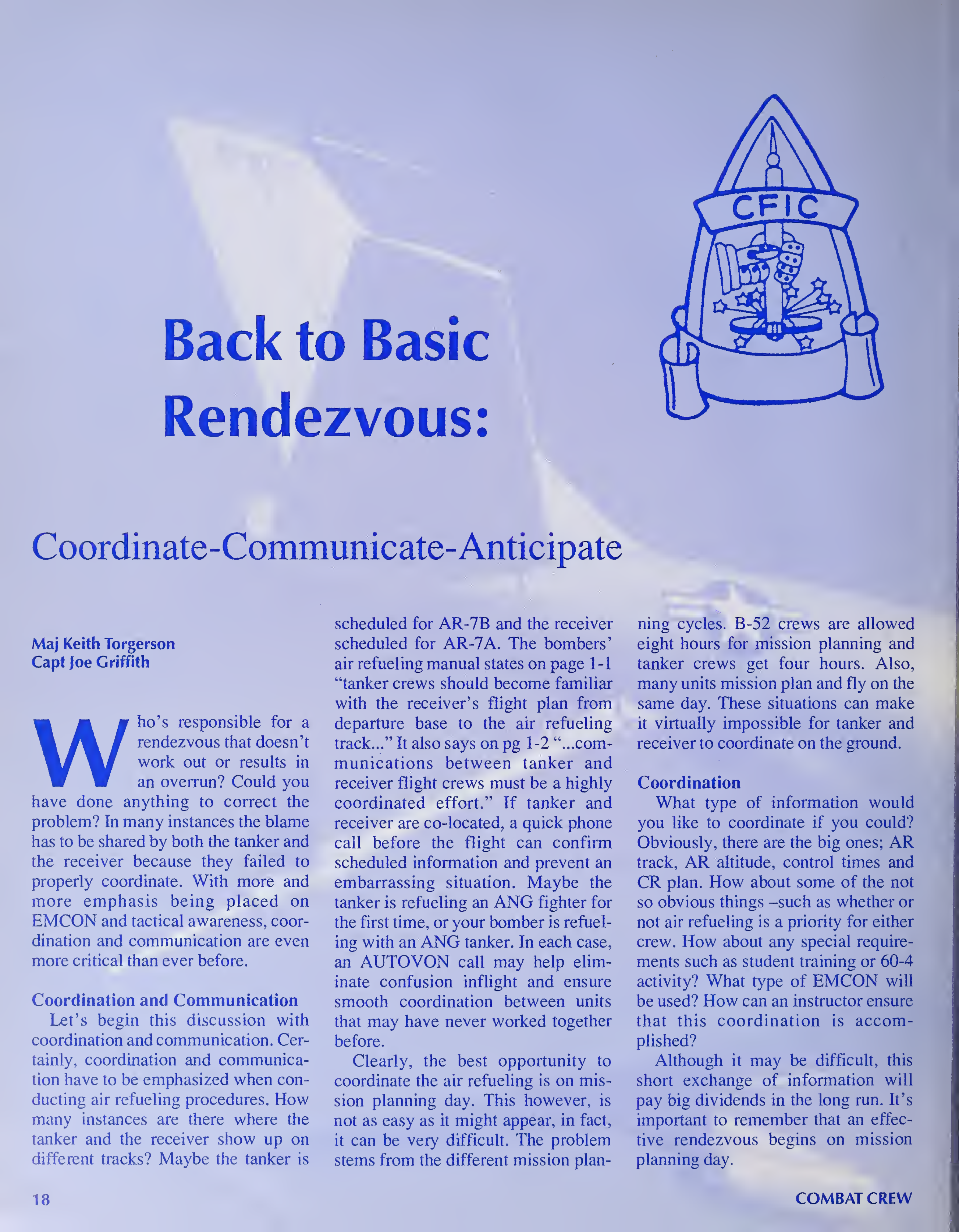
Needless to say, today the syllabus specifically states that the rudder demo is a gear up maneuver. It also gives direction that the maneuvers specified are to be performed per the guidance provided. Period!

So what does this have to do with SAC professionals?

In just the last few months we have had aircraft damaged during a descent, a near ejection condition from an unbriefed maneuver, engines damaged attempting flight at the edge of the envelope, and more. The common thread throughout was “but it doesn’t say you can’t...” I haven’t seen a Dash One yet that says Lomshavecks (power-off vertical, rolling movement, tumble recovery.) are prohibited either.

The books are written for a purpose. Fly the aircraft in complete compliance with the rules. Doing so will mean the mission will be accomplished, the aircraft returned and best of all the aircrew will live to fly and fight another day. If you see a need for a new/different maneuver, ask for a regulation change or a tech order change. Don’t go out and reinvent the wheel.

Let’s not meet at the end of the runway (or worse), saying “but it doesn’t say you can’t...”



Back to Basic Rendezvous:

Coordinate-Communicate-Anticipate

Maj Keith Torgerson
Capt Joe Griffith

Who's responsible for a rendezvous that doesn't work out or results in an overrun? Could you have done anything to correct the problem? In many instances the blame has to be shared by both the tanker and the receiver because they failed to properly coordinate. With more and more emphasis being placed on EMCON and tactical awareness, coordination and communication are even more critical than ever before.

Coordination and Communication

Let's begin this discussion with coordination and communication. Certainly, coordination and communication have to be emphasized when conducting air refueling procedures. How many instances are there where the tanker and the receiver show up on different tracks? Maybe the tanker is scheduled for AR-7B and the receiver scheduled for AR-7A. The bombers' air refueling manual states on page 1-1 "tanker crews should become familiar with the receiver's flight plan from departure base to the air refueling track..." It also says on pg 1-2 "...communications between tanker and receiver flight crews must be a highly coordinated effort." If tanker and receiver are co-located, a quick phone call before the flight can confirm scheduled information and prevent an embarrassing situation. Maybe the tanker is refueling an ANG fighter for the first time, or your bomber is refueling with an ANG tanker. In each case, an AUTOVON call may help eliminate confusion inflight and ensure smooth coordination between units that may have never worked together before.

Clearly, the best opportunity to coordinate the air refueling is on mission planning day. This however, is not as easy as it might appear, in fact, it can be very difficult. The problem stems from the different mission planning cycles. B-52 crews are allowed eight hours for mission planning and tanker crews get four hours. Also, many units mission plan and fly on the same day. These situations can make it virtually impossible for tanker and receiver to coordinate on the ground.

Coordination

What type of information would you like to coordinate if you could? Obviously, there are the big ones; AR track, AR altitude, control times and CR plan. How about some of the not so obvious things –such as whether or not air refueling is a priority for either crew. How about any special requirements such as student training or 60-4 activity? What type of EMCON will be used? How can an instructor ensure that this coordination is accomplished?

Although it may be difficult, this short exchange of information will pay big dividends in the long run. It's important to remember that an effective rendezvous begins on mission planning day.

Communication/EMCON

Along with coordination, communication is a vital part of a good rendezvous. What is the normal rendezvous and air refueling Emission Option procedure? For mission ready crewmembers, the standard is EMCON 2. Are there any exceptions? According to SACR 51-52 and SACR 51-135 EMCON 1 procedures are authorized for all initial qualification, requalification, and difference training. The tanker regulation even says "...precoordinate with receiver if this option is needed." Other exceptions are safety of flight and to ensure mission success. T.O. 1-1C-15 pg 1-2 states "...procedures do not preclude verbal communications for safety of flight situations or to ensure mission success." It is possible that you may be the only instructor on either airplane so it's important to identify problems before they occur if possible. In any case, prior coordination will pay off.

Preflight to ARCP/Basic Navigation Equipment

To help understand what goes on in each airplane, it is necessary to examine the duties of each navigator and the basic equipment he has to use. Bombers are equipped with dual INSs that have an average drift rate of 1280 ft/hr (from CFIC Handout). In addition they have an ALTER NAV system, Doppler, and APN-69 rendezvous beacon. The B-52 radar picture is computer generated. The B-52's INSs can be either air aligned or ground aligned. The ground align method is most accurate, however it takes approximately 45 minutes with power on to complete. Air alignment takes about 10 minutes and is generally the method used. Tanker aircraft, on the other hand, have one INS rated at about 1 mi/hr, a Doppler nav system or DNS, TACAN, Doppler, and APN-69 rendezvous beacon. The tanker radar uses a 5" CRT and displays raw radar video presented in pure slant range with altitude hole present.

Pacing

From T/O to ARCP, the crew on the bomber is pretty busy. Since they take off with the INSs off, they have to accomplish an air alignment and the subsequent OAS programming or fixing. This is in addition to the level off check, the TAS check, TA functional check, and EW and Gunner equipment status checks. The navigator is concerned primarily with the timing to AR. Throw in a late T/O or a malfunction and the nav team can really get behind the power curve. Tanker pacing on the other hand, is a little dirrerent. Tanker navs, for the most part, prefer to align their INS on the ground. This gives them a better alignment and a usable navigation system as they cross the hold line. The navigator monitors the SID and begins working his time control. The tanker nav is primarily concerned with getting set up in the orbit in the case of a point parallel, or timing to the RZ point. He is also monitoring the radios to ensure the proper air refueling clearance is obtained.

Rendezvous Procedures

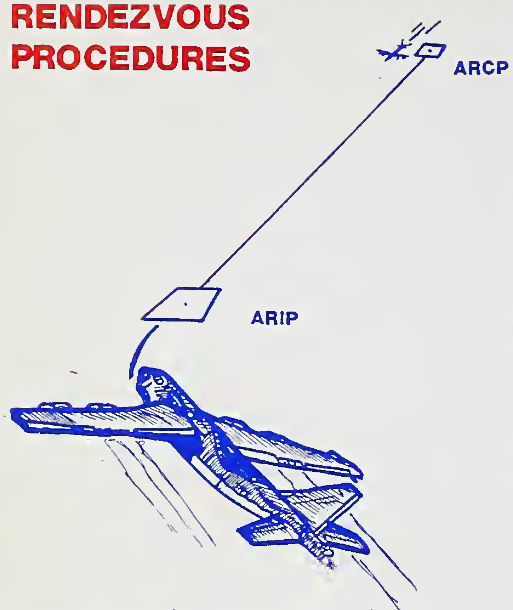
No matter what type of rendezvous is being accomplished, there are some items that are the same every time. The bomber's AR manual states on pg 4-13 that "The Rendezvous checklist will normally be started at least *30 minutes* prior to the Rendezvous control time." It also says on pg 1-2 that "Tankers will begin monitoring designated frequencies and will have the Radar/Rendezvous Beacon operating at least 30 minutes prior to the Air Refueling Control Time." Unless an EMCON 3 or 4 rendezvous is planned, a call 15 minutes prior to the air refueling control time will be made by the bomber. This call will consist of call signs, and changes in ETA (minutes early or late), and altitude. At this point, EMCON 1 and 2 rendezvous differ. Tanker navigators can request an ADF check and will call half-way through the turn, if conducting an EMCON 1 rendezvous. The rest of the differences deal with calls between the boom operator and the receiver pilot.

Enroute RZ

So far we have discussed things that apply to all types of rendezvous. Let's concentrate now on specific rendezvous, namely the enroute and the point parallel. What kind of rendezvous will be done for the next ORI? What if we have to go into combat? More than likely we would be making an enroute rendezvous. Already many units use enroute rendezvous for all their training sorties. An enroute rendezvous is used when the tanker and bomber fly individual tracks to a common point. This point will be at least 50 NM prior to the ARIP/SD, and the track need not be an extension of the ARIP-ARCP track. Another common practice in many units is to make the RZ point at the ARIP. Generally, the reason for placing the RZ point at the ARIP is because ARTCC will not often give up an additional 50 NM of protected airspace for each air refueling track.

During an enroute rendezvous, the bomber and the tanker should arrive at the rendezvous point at the same time. If the planned level off is within 1 hour flying time from the ARIP, level off may be accomplished with 1000' separation between lowest tanker and highest bomber. If the planned level off is greater than an hour flying time from the ARIP, altitudes at the RZ point will provide at least 1000' separation between the highest tanker and lowest receiver. What happens when

RENDEZVOUS PROCEDURES



someone arrives at the RZ point early? "If orbit delays are required, they will be accomplished by orbiting upstream of the RZ point along an extension of the track from the RZ to the ARIP/SD." (T.O. 1-1C-1-15) If orbiting is necessary, use 30 degree bank turns and a minimum of 15 NM straight legs. The RZ point should be at the downstream end of the orbit, with the orbit airspeed being 275 KIAS or Mach 0.78 whichever is lower.

Point Parallel

Perhaps the second most practiced rendezvous between the B-52 and KC-135 is the point parallel rendezvous. The rendezvous for the bomber will normally begin with the identification of the tanker beacon. The tanker should be established in an orbit. The orbit is conducted in ARTCC assigned airspace that measures 60 NM x 25 NM. This "box" is further defined as 18 MN on the holding side, 7 NM on the non-holding side. The box also extends 48 NM toward the ARIP and 12 NM past the ARCP. The tanker will orbit in this box until center clears them to "conduct air refueling operations." Once cleared for air refueling, the orbit area is extended all the way to the ARIP. Refer to SACR 55-3 for further guidance.

Normally, the rendezvous is planned for an altitude differential of at least 2000' but not more than 9000' with the receiver at the higher altitude. In reality the bomber will try to arrive at the ARIP at the rendezvous altitude. The bomber will plan to cross the ARIP at KIAS and maintain 310 KIAS until reaching 1 mile.

Tanker airspeed will be 275 KIAS. The tanker will determine the receiver's ARIP time and proceed toward him based on the 15 minute call. As the tanker proceeds toward the ARIP, the tanker nav is getting established on the proper offset. It's important to know that the turn range and offset chart is based on reciprocal tracks. If the tanker is not on the reciprocal heading or if the bomber isn't on centerline, the rendezvous could be bad. To determine what TAS to use, it is necessary to convert IAS to TAS. The tanker nav has an IAS to TAS conversion chart in the air refueling manual, although it is not corrected for outside air temperature. Because of this, the converted TAS tends to be a little slow. This fact alone is not that significant, however if either airplane is off speed it can add an additional mile to the turn range. If accurately computed and executed, the tanker should roll out approximately 3 NM in front of the bomber. If the offset is too close to track, the tanker may still roll out ahead of the bomber but off to his right. If his offset is wide the rendezvous may overrun because the forward range between the aircraft is less when the turn range is reached. Predicting these situations is fairly easy but what can the bomber nav do to help spot an overrun? A good technique is to start a stopwatch when you determine the tanker to be at the turn range. The tanker should take 2 minutes to complete a 180 degree turn, so when 1 minute has elapsed he should be halfway through. Since this call is made by the tanker when using EMCON 1, it is only a player for EMCON 2 and 3. A rule of thumb is if the tanker is inside 6 NM forward range or beyond the 60 degree line, an overrun condition may be imminent.

If the rendezvous is being accomplished using EMCON 1 procedures, the tanker navigator may ask for a DF steer. To accomplish a DF steer, simply key the mike switch without talking and transmit a steady signal over UHF radio for 10 seconds. Each transmission will be ended with the receiver's call sign. Tanker navs use this information at requested range calls to crosscheck their equipment and their offset.

Alternate rendezvous

What can be done if the primary means available to conduct the rendezvous are lost? Some of the suggestions in the AR manual include asking for vectors and separation advisories from ATC to help affect the RZ, DME/radial information from a common TACAN, or simply having the tanker adjust his final orbit pattern to depart over the ARCP on the refueling heading on the receiver's ETA to the ARCP. No matter what alternate method is started, it's important to remember that if electronic contact is established a normal rendezvous will be accomplished.

Conclusion:

In summary, we have reviewed the importance of coordination *before* conducting air refueling procedures. Anytime two airplanes plan to be very close together, it is essential for everyone involved to know exactly what is going on to be situationally aware. In addition to the coordination aspect, we discussed different communication requirements needed for the types of rendezvous we make. Now if you are an instructor or an old crusty nav you must also **anticipate**. You may be the only instructor on either airplane, and because of your knowledge and experience you may be able to recognize a situation before it develops into a safety problem. Remember, good rendezvous' begin on the ground. **Coordinate**, **communicate**, and then **anticipate**.

SAC INSTRUMENT FLIGHT COURSE

I'M READY! HO-BOY AN OVERSEAS TDY!
3
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6
KIRK

Making an International Flight: Are You Ready? Really?

Capt Jim Grigsby
SAC IFC

This month SIFC joins an old friend, Maj Gravitz Mushnik, just in time for the squadron morning briefing. Sitting next to Gravitz and the other members of his crew, (affectionately known in the squadron as the "Colony") Lt Don Wahn, the pilot; Maj "Mad Dog" Torgesahn, a master navigator (master navigators go anywhere they want to); and MSgt Omar Crafty, the boom operator. The noise level in the room drops to a dull roar as the ops officer, Lt Col Heybob, starts the briefing. "Good morning everyone. As you can see there have been a few changes to the 60-9 flying schedule. Maj Mushnik, we have an HHD tasking for you and your crew, so your crew won't be flying tomorrow. See me afterwards and I'll fill you in on the details."

Gravitz went down the hall after the briefing to Lt Col Heybob's office and knocked on the door. "You wanted to see me, sir?" Lt Col Heybob looked up from a pile of paperwork he was working on and said "Yeah, Gravitz. We have a short notice from HHD tasking to send a crew to Spain in three days. Looks like you're it."

"Hey sir that's great! Thanks for selecting my crew," said Gravitz.

"Anytime, Mushnik (there wasn't anyone else available). There's one more thing, however. I want you to use this TDY to show Lt Wahn what it takes to go overseas. We're sending him to Castle when he gets back from this trip. Now get out of here; your crew has a lot to do if you're going to Spain in three days."

As Gravitz left Lt Col Heybob's office, he began thinking about what he should say to Lt Wahn. "Probably one of the biggest areas most guys have trouble with," Gravitz thought to himself, "is knowing how to plan for an international flight. So that's where I'll start."

As Gravitz walked into the mission planning room, he said "Hey Don, Lt Col Heybob and I were just talking about you."

"Am I in trouble again?" asked Lt Wahn. "Actually, no," said Gravitz. "It looks like the squadron is going to send you to Castle to upgrade after we get back from this TDY." "Finally!" said Lt Wahn. The nav and the boom looked at each other and said (in unison) "I don't believe it."

"I'm supposed to show you all I know about going TDY overseas on this trip," said Gravitz. "Well, that's easy," said MSgt Crafty. "There are only two things you need to go TDY –your wallet, and a fast pair of tennis shoes." "Now wait a minute boom, there's one more thing you forgot to mention to the Lieutenant," said Maj Torgesahn. "What goes TDY – stays TDY!"

"Okay, you guys, enough clowning around, we've got a lot to do," said Gravitz. "Nav, you and the boom check with scheduling to see what they have for us on the mission. In the meantime, Don and I have a few things to go over for this trip. We'll all meet at the gym for our tri-weekly workout around noon. Anyone up to Sally's for lunch?" (Sally's was a local health food place that had recently become popular with the crew force). "Looks like we're all in," said Mad Dog. "Just what I need," said the boom. "More yogurt and bran muffins. What ever happened to beer 'n' burgers?"

After the nav and the boom left, Gravitz said, "You know Don, one of the best places to start to get an overall large photo look at planning for an international flight is to go to AFR 60-16. Let's review some of the things mentioned on the first page that are worth highlighting."

"Paragraph 1-1b says, "Although the International Civil Aviation Organization (ICAO), an affiliate of the United Nations, helps to standardize and regulate international civil aviation, ICAO members do not have to conform to its Standards and Recommended Practices (SARP). If you look in chapter six of FLIP General Planning you'll see the ICAO had its origin in the early forties. Representatives from various countries met in Chicago, Illinois, in 1944 to discuss issues related to standardizing international aviation. Referred to today as the *Convention,* the proposals discussed in Chicago were ratified in 1947.

"Standard procedures within the ICAO are facilitated with the use of several types of documents. One such document is known as an *annex* to the convention. There are many different annexes covering topics from personnel licensing to rules of the air. SARPs (standards and recommended practices) are written into *annexes* to the Convention. An annex may contain just 'standards' – mandatory rules considered essential to the safety international navigation, or it may also contain 'recommended practices' –guidelines that are desirable but are binding on ICAO members."

"You know Gravitz, 60-16 says contracting states of the ICAO don't have to comply with the SARPs, yet you seem to be telling me that they have to. I'm confused," said Lt Wahn.

"Well, let me explain," said Gravitz. "You see, one of the articles to the Convention, Article 38, says if a contracting state of the ICAO is not going to comply with ICAO standards, it's supposed to tell the ICAO when its national rules differ from ICAO standards. Paragraph 1-1b(1) in 60-16 says: 'However, each member nation must make known any ICAO procedure it takes exception to, and publish an alternate procedure.' As you can see, a nation's rules of the air are determined by 'what that member does in modifying, rejecting, or conforming to ICAO standards ...' Also, paragraph 10-1c says, 'Each nation prescribes those rules which apply to operating aircraft in its sovereign airspace.' "

"What's sovereign airspace?" asked Lt Wahn.

"I suppose I can best answer that by defining what international airspace is," said Gravitz. "Section II of chapter three in the General Information Booklet of the USAF Foreign Clearance Guide says, 'International airspace is all airspace over areas that are beyond a coastal state's territorial sea. The US claims a 12 NM territorial sea; congruently, the US only recognizes the territorial sea claims of other nations to a maximum of 12 NM.' So if we are flying *inside* the 12 NM limit, we're in sovereign airspace, and we *must* comply with that nation's rules of the air. Outside the 12 NM limit, we are in international airspace."

"Why should I care whether I am in international airspace or sovereign airspace?"

"Because ICAO rules are not binding on military aircraft in international airspace. Article Three to the Convention says, 'This Convention shall be applicable only to civil aircraft, and shall not be applicable to state aircraft' (military, customs, and police services are state aircraft) and that '... The Contracting State undertake, when issuing regulations for their state aircraft, that they will have *due regard* for the safety of navigation of civil aircraft.' The Directive for all DOD agencies which determines the degree of US military compliance with ICAO procedures is DOD Directive 4540.1. As flyers, we come into portions of this directive in many of the regulations we use on a daily basis.

For example, in AFR 60-16, paragraph 10-1b(2) it says, 'The Air Force supports the activities of ICAO and complies with ICAO SARPs in international airspace over the high seas, *military mission permitting*.'

"What do you mean 'military mission permitting'?" asked Lt Wahn.

"There are certain situations where the US will not abide by ICAO rules in international airspace. The term commonly used when operating outside ICAO rules is 'due regard,' which comes directly from Article Three of the Convention. It means while we won't be complying with ICAO procedures, we will operate with 'due regard' for the safety of civil air traffic that may be in the area. DOD Directive 4540.1 lays down specific responsibilities we must comply with to ensure we don't unnecessarily jeopardize civil operators. In addition to AFR 60-16, excerpts from this directive have been incorporated directly into FLIP GP, chapter seven, and chapter three of the General Information Booklet of the USAF Foreign Clearance Guide."

"So where do I find all these 'ICAO SARPs'? I thought all you had to do was take the mission package the Current Operations or the Tanker Task Force guys put together, sign the flight plan, file it, and away you go," said Lt Wahn.

"While the Current Operations and the Tanker Task Force folks generally do a good job in preparing mission planning materials for these types of missions, they can make mistakes just like anyone else. *Nothing* relieves the individual aircraft commander of ensuring his crew is prepared to fly the assigned mission. That means making a prudent check of the mission planning details and ensuring the crew understands the rules they're supposed to adhere to for the type of mission assigned. Anyone who does less needlessly jeopardizes the crew, the mission, and at the very least, may cause embarrassment to the US Government."

"Man, that's a pretty heavy statement," said Lt Wahn.

"It's a responsibility that comes with the job, Don. But getting ready for an international flight is a lot simpler than you might think. For instance, look at paragraph 1-1d in 60-16. It says '... this regulation consolidates often-used ICAO SARPs ...' ICAO rules have been incorporated into AFR 60-16 just like the Federal Aviation Regulations (FARs) were. Also, paragraph 1-1e says, 'For specific information on the requirements of a single ICAO member that are more restrictive than the procedures outlined here ...' we need to refer to FLIP area planning documents."

"Okay. If I read AFR 60-16 and the applicable sections of FLIP General Planning and Area Planning (AP) then I should have everything I need, right?"

"Not quite, but it's a start. Look at paragraph 1-2b and you'll find a pretty good listing of the documents you should be reviewing. It says 'Procedures and special notices in FLIP, the USAF Foreign Clearance Guide (FCG), notice to airman (NOTAM), regulations, manuals, aircraft flight manuals, US Air Force and MAJCOM directives and air traffic control (ATC) instructions govern the operations of US Air Force aircraft...' I guess I'd expand the regulations part of that to include SAC SUP 1 to AFR 60-16, SACR 55-12, Air Operations, and SACR 50-12, Mission Planning. Attachment four of AFM 51-37 has an excellent review of ICAO standard instrument approaches. Finally, I think SACR 55-3 is worth reviewing in detail, especially chapter 10, which discusses many of the overwater tracks you could be exposed to."

"Gravitz, I never knew there was so much stuff to look at before you make an international flight," said Lt Wahn.

"Well, Don, I'd be willing to bet most aircraft commanders don't know a lot of this stuff. Most guys learn from hearing how someone else got into trouble, or by making their own mistakes. Some squadrons do a pretty good job of keeping a TDY book around that has 'been there and done that' stories in it. Occasionally, the Instrument Refresher Course covers some of this stuff, but with a six hour block of instruction once every 17 months, there isn't a lot of time to go into much detail. It pretty much comes down to an individual responsibility. The documents I just mentioned will help you meet all the requirements, but you should also talk to flyers that have been around for a while and ask them to relay some of their experiences."

"Hey, Don, it's getting late. We were supposed to meet the nav and boom at the gym. Let's take a break and this afternoon we'll take a closer look at some key points in the regulations and manuals we've talked about."

"Okay, but don't keep me too late tonight. I got a hot date and they don't call me 'Daddy-Don Wahn' for nothing."

Next month, join Gravitz as he continues his discussion with Lt Wahn as the "Colony" gets ready for their deployment. Until then **Fly safe; Fly smart.**

Higher Level of Discipline

THE CUTTING EDGE

Capt Randall J. Cross
3901 SMES/DOV

You're one of the most dangerous persons we'll ever know. It's hard to pick you out in a crowd. You look normal (most of the time), you act normal (some of the time), and you come in all shapes and sizes. You're the missile combat crew member who has reached the much sought after, ever elusive level of expertise where reference to technical data is no longer required. You are a member of the secret society of tech order gurus, call sign TOGs. Entry to this society requires you go through an internship or trial period which may vary by individual. For you, it could be as soon as your second alert, while others may require a year or more. You'll usually go through a progressive, self-training program. The first block is normally daily inspections. What the heck! You **have** been on crew **all** month and this **is** your seventh alert this month. You can speed read the entire SLFCS rack and tell if anything is amiss. The crew before you did the inspections. How much can change in 24 hours?

The second block entails the transitional type tasks such as daily SCNTs, clock resynchronizations, and the easiest of all, security. Hey! A 6c is a 6c is a 6c! You can handle it. If you forget something, there's the FSC topside, a trained security professional, to pull your posterior out of the fire. After all, he is the one that gets paid for knowing security. The months roll by and you're cruising. There were a couple of minor gliches when you changed over with those "shop pukes." You were only one channel off on the UHF and what's the impact of a couple of switches being misconfigured? The squadron commander jumped pretty deep into your stuff, but that was just a show. He knows you're his main man.

All right! Made it through your first unit check. You still don't understand why you didn't OP. Sure there were six non mission critical deviations (NMCDs), but what impact did they have? Something else is eating at you. Why haven't you been hired into the shop? Surely you're among the best the squadron has to offer. The squadron commander probably wants to keep you close to the nest to form that solid core of deputies, the basis for tomorrow's commanders. Then one day it happens. The OPS officer approaches you about upgrading. It took a little longer than you anticipated, but after all, they did need you around to upgrade some of those **weak** commanders. Besides, you don't "play the game."

Now it's time to prep for your upgrade. Like the CINC said, "It's back to fundamentals." Need to hit those books and really hone those skills for the upgrade. It may mean expulsion from TOG, but it will be worth it. You feel pretty fortunate having ol' Lt Apollo riding the back seat for you. Next to you, he's probably the best deputy in the squadron. Only eight months on line and he's already forecast as a shop hire. The upgrade is history. Knocked it in the dirt, but once again you are the victim of poor evaluator judgment. Only four NMCDs and still no OP. Still can't figure out why Apollo hasn't talked to you. You haven't lost sight of what has happened here. You're a commander and that's the important thing. No more picking up the truck, you set the sleep shift, and inspections are coded DMCCC. You'll take care of the important events as they happen, like security, LF activities, and other commander stuff. You know all those checklists by heart, allowing you to accomplish them with unbelievable speed and some degree of accuracy. After all, now your job is management and you get paid to manage your crew. It's time to kick back and take it easy. Welcome back to TOG.

We've all known MCCMs whose attitude is similar to the MCCM above. If you are one of them, you must realize one thing. Sooner or later you will get caught. You'll run a missile test to a sortie with maintenance personnel in the launcher, or you'll mess up a clock hack and initiate a calibration prior to the time directed, or you'll miss a security situation when it wasn't a bird or a rabbit. Then the farm will be officially yours.

An old crew commander of mine had an interesting perspective in his approach to dealing with the responsibilities of being a missileer. His first premise stated that to be the very best in your profession you are responsible for knowing the contents of approximately 1000 pages of information. For this you are paid a reasonable salary and have the honor of holding a trusted position as an Air Force officer.

The second premise states that to properly apply the knowledge learned in the first premise, you must develop a "higher level of discipline." This entails always referencing tech data for all tasks. Anyone can wing it, reach over, and without referencing their tech data, command an ALCC Holdoff. Most of the time they will get it right. Few develop a level of discipline so high they force themselves to open the book EVERYTIME! Think about it! You must know a virtual plethora of information. You have a checklist to guide you in the application of this knowledge. Doesn't it make sense that we, as missileers, serving as officers in the time honored profession of arms, should always use the materials provided to do the job the best we can? After all, we invest hundreds of thousands of dollars every year to maintain our tech data in the best possible manner.

Don't fall into the complacency trap. Be professional and learn the information you need to do your job. Develop the higher level of discipline that elevates you above the mediocre and disqualifies you as a member of TOG. We have compiled a phenomenal safety record in the ICBM business. Don't let TOGs bring that record to an end.

SAC FLYING MILESTONES

To gain listing, crew members will be selected by their unit commander, have flying hours in SAC aircraft verified by unit flight records, and have no involvement as a causal factor in a Class A, B, or C flight mishap. Names are sent to NAF/DOT and forwarded quarterly to HQ SAC/DOSF.

2 BMW

1000 Hours
Capt Dean A. Armstrong
Capt Douglas J. Sorna
Capt Stephen G. Cunico
Capt James R. Green
Capt Robert D. Lefevers
Capt David K. Lehman
Capt Robert E. Sippel
SSgt Kenneth D. Osborn
Sgt John W. Reigelsberger
Sgt Robert S. Hart
Sgt Matthew W. Reardon
Sgt Richard D. Smith

2000 Hours
Lt Col Charles M. Tutwiler
Maj Harold O. Arbogust, Jr.
Capt Christopher W. Wank
Capt Frederick Van Wicklin

3000 Hours
Col William J. Liquori
MSgt Omer D. Crafton
TSgt Celeste Barcelo
TSgt Charles P. Nicholson
SSgt Michael D. McCoy
SSgt John P. Piety
TSgt Clyde Covington, Jr.

5000 Hours
CMS Joseph A. Gallaucci
MSgt George M. Perez
TSgt Marvin L. Aldrich

7 BMW

1000 Hours
Capt Bedenbaugh M.
Capt Byron Copeland
Capt Gary E. Molenaar
Capt Brian Demunnik
Capt Paul A. Griffith
Capt Tad T. Hervas
Capt Donald G. McClarin
Capt Dwayen P. Olsen
Sgt Floyd Atkins

2000 Hours
Lt Col Thomas F. Smith
Maj Gary L. Ellsworth
Capt Michael A. Kolb
Capt Thomas L. Cook

3000 Hours
Maj Martin J. Baumann
SSgt August M. Kamps

28 BMW

1000 Hours
Capt Robert S. Huntsman
Capt Kevin R. Kirkpatrick
Capt Jackson S. Harris, Jr.
Capt Robert H. Russell
1Lt Cary W. Johnson
SSgt Cindy L. Herdt
Sgt Kurt D. Bartz
Sgt Loren A. Davy

2000 Hours
Maj Gregory C. Winn
Capt Rory D. Adams
Capt Stephen C. Barron
Capt James L. Edmiston
Capt William J. Freeman III
Capt James E. Truslow
Capt Scott A. Jordan
Capt Thomas S. Miller
Capt William E. Roberts, III
Capt Clinton E. Taylor
Capt Eldon E. Bell
Capt William R. Coggins
Capt David T. Zehr
SSgt Richard L. Bradberry

3000 Hours
Maj Thomas T. Dyer
Maj Clifford M. Wippel
Capt Donald R. Kelly
TSgt Stephen A. Johnson

4000 Hours
Lt Col Anthony M. Beat
Maj Patrick J. Larkin

43 BMW

1000 Hours
Lt Col Kenny M. Thetford
Maj Christopher S. Daria
Maj John S. Sakai
Maj Richard J. Pulis
Capt Daren J. Eldridge
Capt Frederick Ruthling
Capt Richard J. Hock
Capt David D. Snodgrass
Capt Roye R. La Cour
Capt M. David Lee
Capt Scott K. Campbell
Capt Scott E. Stewart
Capt Timothy L. Long
Capt Troy A. Turner
Capt Timothy R. King
Capt John L. Wright
Capt Jon E. Johnson
Capt Carlos R. Roman-Diaz
Capt Eddie L. Bell, Jr.
Capt Matthew G. Casella
Capt Timothy D. Croft
Capt Matthew E. Hughes
Capt James M. Walsh
Capt Gerald J. Harris
Capt David G. Smith
Capt Terrance J. Schachtner
Capt Alvin B. Hyatt
Capt Ronald L. Funk
Capt William F. Flood
Capt Marlon Ruiz
Capt Lynn A. Geiselhart
Capt Norman J. Riebe
Capt James W. Koenn

Capt Frank J. Kehl, Jr.
Capt Joseph A. Toler
Capt Jeffrey S. McIntyre
Capt Kurt W. Rohr
Capt Norman D. Edwards
Capt Ron A. Baumgardner
Capt Douglas W. Shaw
Capt Mark C. Burks
TSgt Lee M. Huntsinger
SSgt Timothy A. Smith
SSgt Shawn M. Daugherty
SSgt Gene Wallace
SSgt Craig G. Watson
Sgt Nicklas K. Olson
Sgt William M. Johnson

2000 Hours

Lt Col Raymond C. Bishop
Lt Col William C. North
Lt Col William J. Smith, Jr.
Maj Kent A. Esbenshade
Maj Steven J. Keith
Maj Russell V. Lewey
Maj Mark C. McGeehan
Maj Nedwin R. Ward
Maj Mario A. Garza
Maj Phillip W. Gronseth
Maj George R. Hoffeditz, Jr.
Maj Dennis C. Porter
Maj Keith R. Warren
Maj Billy R. Miles
Maj Linda M. Phillips
Capt Thomas L. Cook
Capt Blake L. Donald
Capt Mark W. Dibrell
Capt James R. Fosness
Capt Paul J. Moscarelli
Capt Bruce C. Townsend
Capt Bradley E. Brown
Capt Rawson G. Abernathy
Capt Michael B. Barnstable
Capt Richard D. Correa
Capt Grant E. McMillin
SMSgt Scott E. Stewart
MSgt John R. Cate
MSgt Jeffrey S. Fannin
SSgt Douglas E. Lunsford
SSgt T. Charles

3000 Hours

Col Julian B. Hall
Lt Col William J. Evans
Lt Col Richard C. Hughes
Lt Col Patrick M. Moran
Maj Fred Gray
Maj Ronald E. Bjornstad
Maj Robert N. Hess
Maj Scott R. Phillips
Capt Eric C. Smith
SMSgt Gary L. Hall
MSgt Thomas B. Lindsey
MSgt Melvin M. Hitchcock
TSgt Joseph E. McCollum
TSgt Byron S. Davis
SSgt Leonard J. Lombardi
SSgt James R. Howard

4000 Hours

Lt Col John N. Shockey
MSgt Joseph N. Robertson
MSgt Jeffrey L. Zurakowski

55 SRW

1000 Hours

Maj Dewey L. Hurt
Maj Theodore L. Tuckerman
Maj James J. McGrail, Jr.
Capt George R. Cook, Jr.
Capt Alan H. Haberecht
Capt Ralph Ah Sam
Capt Stephen H. Ehlers
Capt Richard T. Richenberg
1Lt Ronald L. Addicott
1Lt Ernest J. Desimone
1Lt Eric R. Huefner
1Lt David J. Rees
1Lt Wesley E. Smith
1Lt Richard M. Clark
1Lt Golda T. Eldridge, Jr.
1Lt Larry C. Lucas
1Lt John F. Rued
SMSgt Wesley E. Wood
MSgt Joseph G. Garcia
TSgt Anthony V. Van Hecke
Sgt Steven R. Quickstad
A1C Harold L. Wenner

2000 Hours

Maj Timothy D. Killbrew
Maj Wesley M. Smith
Maj William S. Thomas
Maj Robert E. Wheelock, Jr.
Capt Marcelyn A. Adkins
Capt Steven R. Andress
Capt Leslie M. Hausse
Capt David E. Hill
Capt Robert L. Ledbetter
Capt Jeffrey L. Needham
Capt Frederick J. Norman
Capt Michael L. Polansky
Capt Robert F. Ross
Capt Mark A. Spadaro
Capt Howard O. Triebold, III
Capt Burton L. Vandenburg
Capt Wade B. Watts
MSgt Glen L. Murdaughm
SSgt Charles C. Hensley
SSgt Robert J. Maxwell
Sgt James R. Lindley IV
Sgt Patricia L. Ballou

3000 Hours

Capt Stephen J. Enzweiler
Capt Michael T. Gay
Capt Robert D. Hall
Capt Edward T. Haynbes
Capt Dwight F. Lewis, Jr.
Capt Robert J. Maddox
MSgt Wayne B. Casey
MSgt Charles M. Denney, Jr.
TSgt Mark G. Snow
SSgt James M. Pusateri
Sgt Jeffrey Akers

4000 Hours

Maj Raymond C. Bradbury
Maj Michael P. Sjoberg
Maj George A. Cawl
Capt Harry S. Collins
SSgt Donald A. Anderson
SSgt Scott H. Astern
Sgt Jeffrey L. Sanders

5000 Hours

Maj Grady W. Massey, Jr.
CMSgt Jack M. Patton

92 BMW

1000 Hours

Capt Richard H. Bruce
Capt Jack L. Dein
Capt Eric D. Johnson
Capt Ilias E. Kavourgias
Capt Michael A. Macek
Capt Patricia D. Morales
Capt Jeffrey B. Smith
Capt John E. Succo
SSgt James M. Putnam, Jr.
SrA Frank R. Bernal

2000 Hours

Capt David G. Paselk
Capt Michael T. Schardt
Capt John E. Seamens
SSgt Jayson D. Lively

3000 Hours

Col Michael G. Routsala

4000 Hours

SSgt Kenneth K. Miyazono

PROFESSIONAL PERFORMERS

2Lt Viren K. Lemmer and 1Lt Lisa S. Atkins

Missile Crew

The 44 SMW Crew R-083, consisting of 1Lt Lisa S. Atkins, MCCC, and 2Lt Viren K. Lemmer, DMCCC, is SAC's Missile Crew of the Month.

While on alert at Golf launch control center (LCC), Lts Atkins and Lemmer noticed a faint but distinct smell of overheating electrical equipment. They also noticed that the entire column of lights was illuminated for G-11 on the missile status indicator panel (MSIP). Suspecting a possible fire, the crew quickly checked all the equipment racks for popped circuit breakers or overheat indications. Detecting no abnormalities, the crew promptly relayed indications to wing job control who directed the crew to attempt data store and processor (DSAP) fault/reset to clear the illuminated lights for G-11.

Immediately after transferring their timeslot, per the DASP fault checklist, the smell of smoke greatly intensified. In addition, the crew detected heat emanating from the area directly above the motor generator. At this time, the crew isolated the motor generator as the source of their fire indications. Transitioning to the LCC fire/overheat checklist, they positioned circuit breaker 14-16-18 to "off" to electrically isolate the AC side of the generator. As circuit breaker 14-16-18 was set to "off," the crew noted brush chattering and continued smoke. They immediately determined that shutdown was required. Lts Atkins and Lemmer completed shutdown procedures and contracted the squadron command post to confirm proper reassignment of critical emergency war order command and communications responsibilities.

By quickly identifying the source of the fire and taking corrective actions, Crew R-083 demonstrated superior leadership qualities, professionalism, and weapon system knowledge.

ICBM Maintenance

SSgt Richard K. Davis, Power, Refrigeration, Electric (PREL) Shop Technician/Trainer, 90th SMW, F. E. Warren AFB, is SAC's ICBM Maintenance Technician of the Month.

Sgt Davis saved a missile guidance section from critical damage when a payload transporter environmental control system failed during extreme cold weather. Using his superb trouble shooting abilities, he restored the heating system in minimal time. Sgt Davis devised a new method for brine pump rebuilding, using a wheel puller and eliminating use of a hammer to separate the pump from its body. During the checkout of a leaking guidance control conditioning unit, Sgt Davis discovered that the liquid level gauge assembly was leaking because the sight glass was cutting its rubber seals. He immediately initiated a quality deficiency report and submitted an AFTO Form 22. This change will save the Air Force approximately $560.00 for each defective seal.

Aircraft Maintenance

SSgt Daniel J. Kenyon, 301 AREFW, Malmstrom AFB, is SAC's Maintenance Airman of the Month. Sgt Kenyon is the most prolific Guidance and Control Systems (GCS) specialist assigned to the 301st AREFW fully qualified in automatic flight control systems and the first person in the squadron to complete Rivet Workforce conversion training. His overall superior performance and advanced technical capabilities have contributed to all outstanding maintenance accomplishments.

Sgt Kenyon was selected as the GCS member of the 301 AREFW maintenance team for Proud Shield 89, SAC's Bombing and navigation Competition. He collimated four periscopic sextants in the backshop, reinstalled each on our four aircraft, and mated the sextants to the mounts. His precise work resulted in mission ready equipment, essential toward accumulating the highest scores during the celestial navigation phase of Bomb Comp. The wing, participating for the first time in this competition, was awarded the Bruce K. Holloway Trophy for these efforts.

Difficult maintenance problems have provided Sgt Kenyon the opportunity to display his superior ability to isolate, troubleshoot, and repair nagging recurring discrepancies. On aircraft 62-3533, uncommanded pitchup inputs to the autopilot system repeated four times. Sgt Kenyon flew on the jet, isolated the problem to the MC-1 amplifier, replaced the amp, and operationally checked the system. There has since been no further occurrences of this malfunction. Aircraft 62-3537 had a history of fuel quantity indication problems in the number four reserve tank. Sgt Kenyon rewired the connections to all five fuel probes in the system with resultant malfunction-free operation since repairs. While TDY to NASL, he troubleshot and replaced a copilot RGA computer, clearing a repeat two discrepancy. These few examples are indicative of Sgt Kenyon's daily performance and astute diagnosis and repair abilities.

Munitions Maintenance

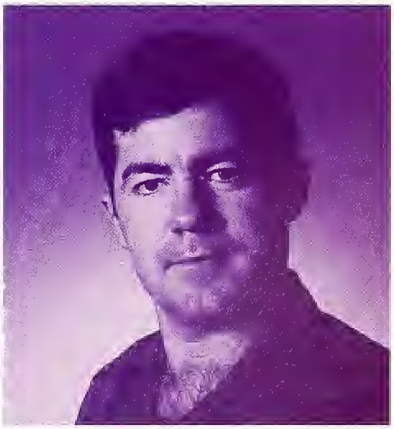
TSgt Regina P. Groninga, 96 BMW, Dyess AFB, is SAC's Munitions Airman of the Month. Sgt Groninga's outstanding performance as NCOIC, Munitions Aerospace Ground Equipment (AGE) section is a direct reflection of her professional management and dynamic leadership abilities.

Despite a manning of 76%, Sgt Groninga's management skills and technical knowledge have enabled her section to maintain in 1989 an incommission rate of 93% on 20 MHU-196/M munitions trailers; well above the established emergency war order (EWO) standard of 75%.

Sgt Groninga coordinated and supervised the completion of two TCTOs for the MHU-196/M. The TCTOs were to be accomplished not later than 10 and 30 days from receipt; however, due to Sgt Groninga's direct supervision, both TCTOs were accomplished on all 20 trailers while constantly maintaining EWO status.

Sgt Groninga is always looking for ways to improve her munitions AGE systems and the technical data used to maintain and operate them. She submitted an Engineering Disposition on the MJ-40/E munitions lift truck which resulted in eliminating a task dealing with the removal and cleaning of an internal hydraulic filter, which had been physically impossible to do. She also submitted a Quality Deficiency Report (QDR) on the jack keys used on the MHU-196/M trailer which resulted in a TCTO that determined that the jack keys could be removed. This QDR resulted in a savings of $380 per trailer for a total savings of $7600 for the squadron.

SSgt Richard K. Davis



SSgt Daniel J. Kenyon

TSgt Regina P. Groninga

SAC CORNER

Responsibility to Communicate

SMSgt Harvey L. Price (USAF ret.)

Today we hear much about Crew Resource Management (CRM) and what this program will do for SAC crews. I have a true story to pass on about what CRM means to safety and mission effectiveness. The story begins where all SAC aircrews begin their march towards becoming a qualified air crewmember.

At Castle AFB several years ago, the requirement existed for all crews to fly a solo mission prior to departing the watchful eye of the school and its instructors. Once the crew passed their 60-4 evaluation, it was time to solo. The crew was allowed to plan their sortie by themselves, but was also required to brief the mission to an instructor (flight commander).

Everything went fine on mission planning day; even the briefing to the flight commander was rated good. The flight day came very quickly, maybe because of the excitement of flying by yourself. The AC and his crew arrived at the squadron on flight day and checked for any changes. There were none; so it was off to the aircraft. It seems everyone was locked into doing his and her job to perfection with little or no talking among themselves. The preflight went well with no problems noted. It was engine start time and the takeoff was going to be on time. The cockpit atmosphere was a little anxious at this point, but everything proceeded with no problems. After engine start came the taxi and it was out to the hammerhead. No problems were experienced at the hammerhead and it was time to prepare for takeoff.

The experienced boom operator on the AC's crew was taught by his IBO to check a couple of things in the cockpit prior to takeoff. But the AC was in the takeoff mode and nothing was going to prevent that short of an engine falling off. The boom thought he saw something that didn't look correct. He sat there in his seat for a couple of minutes trying to decide whether to inquire. About this time the AC made the decision to start the takeoff roll. The boom then assumed everything was all right. After all, when can a boom tell the pilots he thinks something is wrong?

Down the runway they rolled. And rolled and rolled and rolled. (I forgot to tell you it was a 145 wet takeoff.) The pilot called S-1. We were committed now. The boom was waiting for rotation. The pilot called rotation and the AC pulled the stick back but nothing happened except the airplane kept rolling and rolling. The AC pulled back further and further. Still nothing happened. By this time the boom and the nav were getting somewhat concerned. The airplane continued to roll and finally with less than 2000 feet of runway remaining, the nose came up slowly followed by the main gear. The trees at the end of the runway looked like giant redwoods. The aircraft went screaming over the tops and to the grateful thanks of the nav and the boom, the takeoff was successful, if not pretty.

By this time the aircraft had used 110 seconds of water, and was only 300 feet off the ground. The AC had the control stick in his lap, almost to the stop. Finally, he used the trim button to remove the excessive yoke pressure and to move the control column from his lap.

Fortunately, the systems on the airplane worked fine after we were airborne and the mission was flown as planned. Once the aircraft was level and airspeed was stabilized, the boom operator decided to ask the question he had on the hammerhead. Was the stab trim setting supposed to be .9 nose down? Needless to say both the AC and the pilot were startled to hear this question. After a cross-cockpit look that will never be forgotten, and a brief pause to compose themselves, both responded "No."

The boom operator let them know that the actual takeoff stabilizer setting was .9 nose down, not .9 nose up as it should have been. I guess you can say there was a lack of communication, situational awareness and possibly leadership. Fortunately, for the AC and crew, SOMEONE was looking out for them.

There are several lessons to be learned here. One must never feel afraid to be involved in an airplane. You must always be aware of what is happening. The mission effectiveness rests on just that; being aware of what is happening, and communicating. One final note about this episode. I was the boom operator, and the lesson I learned was to be alert and involved. I almost didn't get the opportunity to pass it on.

SAC SAFETY SCREEN

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile syustem IAW AFR 127-2/SS1.

97 AREFS, Eaker Crew R-163: AC Capt Charles McQueen, P 1Lt Kenneth Kopko, N 1Lt Joseph Jaczinski, BO SrA Troy Keach

97 AREFS, Eaker Crew E-180: AC Capt Rhonda Arnold, P 1Lt Russell Allen, N Capt Curtis Honeycutt, BO Sgt Shaun Lewis

340 BMS, Eaker Crew R-32: AC Capt Robert Taylor, P 1Lt Kurt Austin, R Capt John Gay, N 1Lt Kurt Mittmann, EW 1Lt Robert Abel, G Sgt Raymond Walton

340 BMS, Eaker Crew R-112: AC Maj Eugene Stepko, P Capt Glen Lisella, R Capt John Rehmer, N 1Lt Theodore Wagner, EW 2Lt James Tomlin, G SSgt Patrick Lewis

46 AREFS, K I Sawyer Crew R-112: AC Capt Jeffrey F Hancock, P 1Lt William P Hancock, N Capt Vincent M Raska, BO A1C Christopher Meinken

46 AREFS, K I Sawyer Crew R-120: AC Capt Bruce C Pearson, P 1Lt Robert M McCollum, N 2Lt Brian M James, BO A1C Jeffrey D Gilbert

46 AREFS, K I Sawyer Crew R-131: AC Capt Steven Wabrowetz, P 1Lt Anthony Magaletta, N 1Lt Paul E Henry, BO Amn Jonathan Pilkington

307 AREFS, K I Sawyer Crew R-184: AC Capt Kenneth D Rollins, P 1Lt Cameron J Scheel, N 1Lt Albert A Silvani, IBO SSgt Rodney L Derringer

644 BMS, K I Sawyer Crew S-02: AC Capt Robert Frazier, P Lt Richard Bell/Lt Mark Roman, RN Capt David Oetman, N Lt David Boone, EW Capt David Black, G SSgt Duane Woitas

644 BMS, K I Sawyer Crew R-40: AC Lt Col Jack Leonard, P Lt Edward Korzun, RN Capt James Wuensch, N Lt James Windhorst, EW Lt Michael Schaeffer, G SSgt Warren Leill

644 BMS, K I Sawyer Crew R-51: AC Capt Robert Humphrey, P Lt Alan Laursen/Lt Larry McCreary, RN Capt Barry Cousler, N Lt Joseph Cappello, EW Lt Kurt Bedore, G A1C Jeffrey Yoby

41 AREFS, Griffiss Crew E-108: AC Capt Keith Brown, P 1Lt Diane Provost, N Capt Keith Gormandy, B Sgt Randall Crittendon

41 AREFS, Griffiss Crew R-107: AC Capt Todd Gustafson, P 1Lt Peter Gworek, N 1Lt Joseph Keelon, B A1C Richard Geffken

668 BMS, Griffiss Crew R-12: AC Maj Paul Augenstein, P Lt Scott Haverkate, RN Capt Jerry Tshontikidis, N Lt Dana Powell, EW Lt Doug Sanborn, G SSgt Robert Sprague

393 BMS, Pease Crew R-35: AC Capt Roger E Nedel, RN 1Lt Troy D Campbell

393 BMS, Pease Crew R-15: AC Capt Preston W Turner, RN Capt Kevin D Rasmussen

715 BMS, Pease Crew R-26: IP Capt Jack Caszatt, IN Capt Paul Cannizzo

715 BMS, Pease Crew R-10: P Capt Douglas Miller, RN 1Lt Eric Beene

509 AREFS, Pease Crew R-113: MP Capt Duane D Bynum, MC 1Lt Neal C Wayment, NM 1Lt Walter C Bracewell, MB Sgt Michael A Steinkraus

509 AREFS, Pease Brew R-122: MP Capt Gregory J Romain, MC 1Lt Michael D Miller, MN Capt Jeffrey A Ryan, MB SrA Thomas F Rau

509 AREFS, Pease Crew R-131: MP Capt Gregory D Wilson, MC 1Lt Stuart D Kraner, MN 1Lt David P Camire, MB Amn Jason P Lemaitre

351 SMW, Whiteman Crew R-161: MCCC 1Lt Beckey Estabrook, DMCCC 2Lt Scott Gibbs

351 SMW, Whiteman Crew R-101: MCCC 1Lt Michael Ward, DMCCC 2Lt Jeffery S Dilbert

321 SMW, Grand Forks Crew R-011: MCCC 1Lt Gerald C St Cyr, DMCCC 2Lt James G Klingler

351 SMW, Whiteman Crew R-041: MCCC Capt Timothy C Olson, DMCCC 1Lt Kurt A Searfoss

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FLARE

Adapted from *Approach* magazine.

TRICKS ARE FOR KIDS